Owner's Manual

SAFETY SYSTEMS FOR
MARITIME SURVIVABILITY & RESCUE

www.briartek.com

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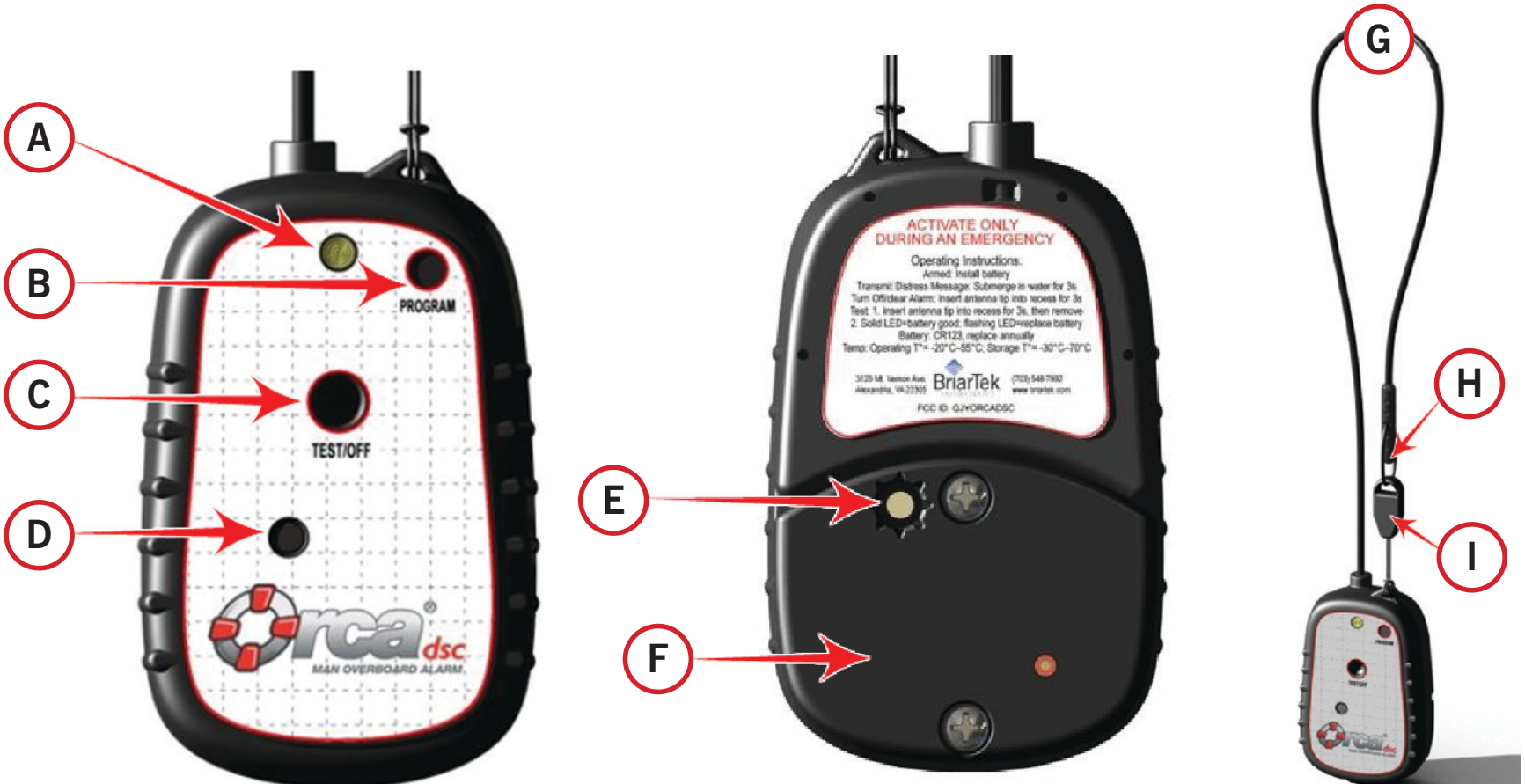
Introduction

ORCA®dsc (Overboard Recovery Communications Apparatus – digital selective calling) is a personal water activated man overboard (MOB) alarm beacon developed by BriarTek, Inc. The beacon is utilized by mariners to aid in the rescue of an MOB victim. ORCA®dsc communicates with existing marine radio communications infrastructure to alert vessels of an MOB event on a DSC-equipped marine VHF radio (VHF radio). ORCA®dsc also includes a 121.5 MHz transmitter module which enables users equipped with a radio direction finder (DF) to locate the MOB.


A
B
C
D
PROGRAM
TEST/OFF
orca dsc
MAN OVERBOARD ALARM
E
F
ACTIVATE ONLY
DURING AN EMERGENCY
Operating Instructions:
Armed: Install battery
Transmit Distress Message: Submerge in water for 3s
Turn Off/clear Alarm: Insert antenna tip into recess for 3s
Test: 1. Insert antenna tip into recess for 3s, then remove
2. Solid LED=battery good; flashing LED=replace battery
Battery: CR123, replace annually
Temp: Operating T°= -20°C–55°C; Storage T°= -30°C–70°C
BriarTek
FCC ID: QJYORCADSC
G
H
I

ORCA®dsc Parts Overview

A - Distress Marker Light (DML): Daylight visible strobe light

B - Program Recess: Utilized when programming/checking individual Maritime Mobile Service Identities (MMSIs)

C - Test/Off: System test and return ORCA®dsc to ARMED state after recovery of an MOB

D&E - Water Sensors: Initiate transmit mode when water submersion is detected – keep clear of debris

F - Battery Door: Contains CR123, 3V lithium battery

G - Antenna: Signal transmission; correct orientation required for maximum transmission range. See “Wearing the Transmitter” on page 10 for instructions on proper antenna employment.

H - Antenna Tip: Utilized for system test, returning unit to ARMED state and programming individual MMSI

I - Lanyard: Detachable antenna lanyard to provide multiple transmitter mounting options

Modes of Operation

ORCA®dsc has three modes:

- **ARMED** - A transmitter is ARMED after a 3-volt CR123 lithium battery is correctly installed.
- **TRANSMIT** - The transmitter switches from ARMED to TRANSMIT mode when it is submerged in water for 4–6 seconds. When the transmitter is ON, it transmits a DSC message on marine VHF channel 70 and subsequently transmits at 121.5 MHz for search and rescue (SAR) authorities or DF-equipped platforms to locate the MOB.
- **DISABLED** - The transmitter is DISABLED when the battery is removed or when the battery is depleted.

Operating Instructions

Important: ORCA®dsc operates within the framework of the Radio Technical Commission for Maritime Services (RTCM) STANDARD 11901.0, Maritime Survivor Locating Devices (MSLD). The Federal Communications Commission (FCC) and U.S. Coast Guard (USCG) use RTCM standards to specify the use and operation of DSC radios. The RTCM standard delineates that MSLDs should not broadcast to all VHF radios within range, but only to VHF radios with a registered individual MMSI that are paired to the MSLD. VHF radios can also be programmed to accept an MSLD's group MMSI.

The ORCA®dsc MOB transmission will not alert a VHF radio until the user programs BriarTek's group MMSI into the vessel's VHF radio(s). It is recommended that the user program his or her individual MMSI into ORCA®dsc as well. Please review "ORCA®dsc MMSI Programming" on page 15 for beacon programming instructions.

Program MMSI

The user may program an individual MMSI into the memory of ORCA®dsc. See the section titled “ORCA®dsc MMSI Programming” on page 15 for detailed instructions on programming an individual MMSI.

Check MMSI

ORCA®dsc can display the individual MMSI programmed into its memory. To perform an MMSI check, insert the antenna tip into the Test/Off Recess until the DML rapidly flashes. This will initiate a battery check. When ORCA®dsc displays the battery condition (solid or slowly flashing DML) insert the antenna tip into the Program Recess for approximately 3 seconds. ORCA®dsc will now flash the individual MMSI programmed into its memory.

Test

The ORCA®dsc test function determines the condition of the battery installed in the transmitter. **WARNING – WHEN PERFORMING A SYSTEM TEST, DO NOT LOOK AT THE DML AS THE LIGHT IS VERY BRIGHT.** To perform a system test, insert the antenna tip into the Test/Off Recess until the DML flashes rapidly. ORCA®dsc will then indicate the battery condition.

A solid DML indicates the battery is OK. A slow flashing DML indicates that the battery should be replaced. When the test is complete, ORCA®dsc returns to the ARMED mode.

Activation

The ORCA®dsc activates within 4–6 seconds upon immersion in water. This is the only method of activation (there is no manual activation). After the ORCA®dsc is submerged for 4–6 seconds, the DML will flash rapidly for 5 seconds to indicate that it will transmit a DSC message. After the unit flashes rapidly for 5 seconds, it will transmit a DSC message and will continue until deactivated. To cancel the transmission, insert the antenna tip into the Test/Off Recess while the DML rapidly flashes. This will cancel the DSC transmission and will initiate a battery check (see Test above). When the battery test is complete, ORCA®dsc returns to ARMED mode.

Deactivate Transmitter

When the MOB is recovered, insert the antenna tip into the Test/Off Recess for 3 seconds. This cancels the DSC transmission and initiates a battery check (see “Test” on the preceding page). When the battery test is complete, ORCA®dsc returns to the ARMED mode.

Wearing the Transmitter

WARNINGS:

- ORCA®dsc MUST BE WORN SO THAT THE WATER SENSORS ARE UNDER WATER AND THE ANTENNA IS ABOVE THE WATERLINE DURING AN MOB EVENT.
- IF NECESSARY, UTILIZE A LANYARD OR OTHER FASTENER TO SECURE THE TRANSMITTER/ANTENNA TO THE USER'S CLOTHING OR PERSONAL FLOTATION DEVICE (PFD) TO ENSURE THE TRANSMITTER DOES NOT BECOME SEPARATED FROM THE USER DURING AN MOB EVENT.
- THE ANTENNA SHOULD NOT BE COILED AS THIS WILL DEGRADE THE TRANSMISSION.

Pendant Method

ORCA®dsc is supplied with a lanyard that may be clipped to the antenna and the ORCA®dsc enclosure. When the antenna is attached to the enclosure, it may be worn as a pendant around the user's neck. This location allows the water sensors to be submerged while keeping the antenna above the waterline.

Jacket Method

ORCA®dsc may be attached to any inherently buoyant life vest, survival jacket, etc. by inserting the beacon enclosure in a pocket/pouch and securing the antenna tip to a strap on the PFD using a lanyard. If the beacon is inserted in a pocket, the pocket should be designed such that water can enter the pocket during an MOB event to allow for water activation. To reduce the chance of an inadvertent activation, the pocket should be designed to allow water to drain so the pocket will not fill with water. If you have questions regarding the optimal method for wearing the ORCA®dsc, please contact BriarTek technical support. Contact information is listed on the inside front cover.

Battery Information

ORCA®dsc has a very low current consumption in the ARMED state. It is recommended that the battery should be replaced once a year or sooner if ORCA®dsc has been activated for more than occasional testing. When ORCA®dsc is in TRANSMIT mode, a new battery will last approximately 18 hours. The battery door is vented to allow gases to escape the battery door pocket while preventing water intrusion.

To Replace the Battery:

1. Ensure enclosure is dry.
2. Using a #1 size Phillips head screwdriver, unscrew the two crosshead screws on the battery door.
3. Remove battery door.
4. Remove used battery.
5. Insert new 3-volt CR123 lithium battery according to polarity diagram on the inside of the battery compartment.
6. Replace battery door. Grasping screwdriver with thumb and forefinger, screw down the battery door. Recommended torque setting is 30 in/oz.
7. Do not over tighten! Applying excessive torque when tightening battery door screws may cause the battery door to crack which can result in water intrusion and beacon failure.

ORCA®dsc MMSI Programming

Overview

Maritime Mobile Service Identities (MMSIs) are nine digit numbers used primarily by VHF radios and automatic identification systems (AIS). MMSIs are regulated and managed internationally by the International Telecommunications Union in Geneva, Switzerland. For commercial users or those who travel outside the U.S., one must apply to the Federal Communications Commission to obtain an MMSI for a ship station license. All vessels required to carry a shipboard radio or those that travel outside the US are required to have an FCC ship station license.

Non-commercial users (e.g. recreational boaters) who remain in US waters can obtain an MMSI through approved organizations such as BOAT US (800-563-1536 or www.boatus.com/mmsi/), SEA TOW (800-4SEATOW), or US Power Squadron (888-367-8777).

The MMSI issued to its owner should be programmed into all equipment capable of transmitting and receiving DSC calls, i.e. fixed mount VHF radios, handheld VHF radios, ORCA®dsc, etc.

MMSI Format

Maritime Identification Digits (MID): MIDs are three digit identifiers ranging from 201 to 775 denoting the country or geographical area of the administration responsible for the ship station. The MID prefix for U.S. based boats and ships are 338, 366, 367, 368 & 369.

All individual ship MMSIs use the format $M_1I_2D_3X_4X_5X_6X_7X_8X_9$ where the first three digits represent the Maritime Identification Digits (MID) and X is any digit from 0 to 9. When a user applies for an MMSI, that person is issued an individual MMSI and may place individual station calls. A VHF radio can also transmit group calls to one or more ship stations sharing a group MMSI. The group MMSI format is $0_1M_2I_3D_4X_5X_6X_7X_8X_9$, where the first digit is zero and X is any digit from 0 to 9. No process currently exists to assign non-federal group ship station identities. However, users having an MMSI assigned by FCC license may create a group identity by inserting a zero before the MID and removing the trailing digit (e.g. a user having an MMSI of *366123450* is allowed to use the group identity *036612345*).

ORCA®dsc is factory programmed with a permanent BriarTek group MMSI of **033809818**. ORCA®dsc will not transmit an individual MMSI until the user programs it into the ORCA®dsc memory.

Programming Individual MMSI into ORCA®dsc

IMPORTANT: Please read through entire instruction set before attempting to program individual MMSI. The user may request BriarTek to program the 9-digit individual MMSI number at the factory or it may be accomplished manually. To program an individual MMSI, follow the instructions below.

1. **Start MMSI programming mode:**
   a. Obtain individual MMSI that will be programmed into ORCA®dsc
   b. Ensure ORCA®dsc is ARMED (battery installed)
   c. Insert antenna tip into TEST/OFF recess for approximately 3 seconds
   d. DML will flash rapidly for 5 seconds
   e. While DML is flashing, place antenna tip into Program recess.
   f. DML will flash rapidly at a faster duty cycle for 5 seconds and then PAUSE (DML is off) for 2 seconds before the programming sequence starts
2. **Program MMSI procedure**
   a. The MMSI will be programmed in the following sequence: $M_1I_2D_3X_4X_5X_6X_7X_8X_9$
   b. Determining number (M_1 (0-9), I_2 (0-9), D_3 (0-9), etc…)
      i. Nomenclature
         1. Programming visual

a. 2 second flash is graphically represented by (--)
b. 1 second flash is graphically represented by (-)

2. MMSI confirmation visual
   a. 500 millisecond flash is graphically represented by (+)
   b. 100 millisecond flash is graphically represented by (*)

ii. ORCA®dsc will flash up to 10 times representing numbers 0-9 for each position M_1- X_9
   1. The starting flash is 2 seconds long and represents digit “0” (--)
   2. ORCA®dsc continues flashing to represent digit “1”. This is represented by two flashes, one 2 second flash followed by one 1 second flash (--,-)
   3. ORCA®dsc continues flashing to represent digit “2”. This is represented by three flashes, one 2 second flash followed by two 1 second flashes (--,-,-)
   4. This process is repeated through digit “9” (--,-,-,-,-,-,-,-,-,-)

c. To select a number, press the antenna tip into the “PROGRAM” recess when the DML flashes the required digit
   i. If ORCA®dsc does not sense the antenna tip after flashing digit “9”, then it will exit programming mode and no individual MMSI will be recorded in the ORCA®dsc memory

d. ORCA®dsc will confirm the digit by rapidly flashing the sequence back to the user.
    i. Digit “0” is represented by (*), while digits “1-9” are represented by (+ through +,+,+,+,+,+,+,+,+)
e. This process repeats through MMSI positions $I_2 - X_9$
f. Upon completion of programming ORCA®dsc, it will display its programmed MMSI by flashing it
g. This is followed by a 2 second pause and then a battery check (solid DML=battery OK, flashing DML=replace battery)
h. ORCA®dsc returns to its “ARMED” state
i. The MMSI will only be stored in the ORCA®dsc memory if all 9-digits are successfully programmed
j. The programmer may stop the programming process at any time (i.e., if a mistake was made during program) by inserting the antenna tip into the “TEST/OFF’ recess

3. Programming example

a. Program MMSI “368010230”

i. Start MMSI programming mode by following steps 1a-1f

1. Position M_1 should be digit “3”
   a. ORCA®dsc flashes digits 0, 1, 2, 3 (--,-,-,-)
   b. During the fourth flash, place the antenna tip into the “PROGRAM” recess
   c. ORCA®dsc confirms digit “3” has been programmed by flashing (+,+,+)
2. Position I_2 should be digit “6”
   a. ORCA®dsc flashes 0, 1, 2, 3, 4, 5, 6 (--,-,-,-,-,-,-)
   b. During the seventh flash, place the antenna tip into the “PROGRAM” recess
   c. ORCA®dsc confirms digit “6” has been programmed by flashing (+,+,+,+,+,+)
3. Position D_3 should be digit “8”
   a. ORCA®dsc flashes 0, 1, 2, 3, 4, 5, 6, 7, 8 (--,-,-,-,-,-,-,-,-)
   b. During the ninth flash, place the antenna tip into the “PROGRAM” recess
   c. ORCA®dsc confirms digit “8” has been programmed by flashing (+,+,+,+,+,+,+,+)

4. Position X_4 should be digit “0”
    a. ORCA®dsc flashes 0 (--)
    b. During the first flash, place the antenna tip into the “PROGRAM” recess
    c. ORCA®dsc confirms digit “0” has been programmed by flashing (*)
5. Repeat for position’s X_5 – X_9
6. When successfully programmed, ORCA®dsc will flash:

a. M_1	(+,+,+)	3
b. I_2	(+,+,+,+,+,+)	6
c. D_3	(+,+,+,+,+,+,+,+)	8
d. X_4	(*)	0
e. X_5	(+)	1
f. X_6	(*)	0
g. X_7	(+,+)	2
h. X_8	(+,+,+)	3
i. X_9	(*)	0

Specifications

- BriarTek group MMSI: 033809818
- Size: 3.500” x 2.271” x 0.920”
- Weight: 3.1 oz.
- Power: 156.525MHz = 100 mW; 121.5MHz = up to 100mW
- Tracking Range: 2 NM from small craft, 5 NM from ship, 20 NM or greater from aircraft
- Alerting Range: 1 NM to VHF radio
- Power Source: One (1) 3 volt CR123 lithium battery
- Battery Life: One year (Armed mode); 18 hours continuous once activated (Transmit mode)
- Activation: Water
- Current Draw: Armed 15uA; Transmit (DSC): 250mA;
- Transmit (121.5MHz): 80mA
- Modulation Frequency: 121.500MHz & 156.525MHz
- Antenna: 25 inch external antenna with strain relief (the length can be modified based on user needs)
- Operating Temperature -20° C (-4° F) to +55° C (131° F)
- Storage Temperature -30° C (-22° F) to +70° C (155° F)

Warranty

BriarTek will provide a one-year warranty on the ORCA®dsc following the purchase date.

If a component fails to function properly during its warranty period (one year), the manufacturer will proceed according to its warranty as follows:

BriarTek Inc. guarantees each product it distributes to be free from defective materials and workmanship and agrees to remedy any such defect, or to furnish a new or equal part in exchange (at its option) for a period of one year from the date the component is purchased. For an exchange of the product, please contact BriarTek at 703-548-7892 or on the web at www.briartek.com and a customer service representative will provide the necessary instructions. Original receipt is required for all exchanges.

This warranty is void if:

- any component has been subject to misuse or improper installation by a non-BriarTek employee, or has been repaired or altered by a non-BriarTek employee.
- any component fails to function properly after being put into service due to something other than defective materials or workmanship, i.e. excessive temperature, humidity or shock while component is in storage.

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